

PATENT

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant(s): Masaki MIYAMOTO  
Int'l Application No.: PCT/JP2005/005962  
Application No.: **NEW APPLICATION**  
Filed: September 28, 2006  
For: **MOVABLE SINKER APPARATUS AND SINKER OF WEFT  
KNITTING MACHINE**

**LETTER**

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Sir:

Amended claims are attached hereto (which correspond to Article 34 amendments or to claims attached to the International Preliminary Examination Report), as required by 35 U.S.C. § 371(c)(3). The Article 34 amended claims are incorporated in the included substitute specification and Preliminary Amendment.

Respectfully submitted,

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portions of the sinkers being supported in a swingingly displaceable manner on the needle beds in the vicinity of the needle bed gap, and recessed portions for retaining and pressing down a knitting yarn of a previous loop that has been knitted being formed as knitting yarn receiving portions on front end portions of the sinkers moving forward into the needle bed gap,

wherein the front end portion of the sinker has a shape of an arm extending to a lower portion of the needle bed gap in a circumferential direction with a substantially constant radius from the base portion,

wherein on a portion closer to the front ends from a knitting yarn receiving portions on the arm are formed protruding portions that project outward in radial directions of swinging displacements,

when the protruding portions are on a straight line linking between centers of swinging displacements of the base portions that are supported by the needle beds, the protruding portions of the sinkers are positioned closest toward the needle beds opposed thereto, and inclined faces inclined toward inner sides in the radial direction are respectively formed on the front end side and on the base portion side in the circumferential direction, and

wherein the protruding portions of the sinkers provided on the needle beds that are opposed to each other

pull down a knitting fabric in a lower portion of the needle bed gap, sandwiching the fabric therebetween.

Furthermore, the invention is directed to a sinker for use in a movable sinker apparatus having a base portion which is supported in a swingingly displaceable manner in a vicinity of a needle bed gap on a needle bed and a front end portion which is moved forward to the needle bed gap to knit a knitting fabric by an interaction with a knitting needle, the sinker comprising:

a front end portion having a shape of an arm extending to a lower portion of the needle bed gap in a circumferential direction with a substantially constant radius from the base portion,

wherein the sinker is shaped into a plate,

wherein on the arm are formed a first protruding portion that is formed between the base portion and the front end and that projects in a circumferential direction on the front end side, and a second protruding portion that is formed on a portion closer to the front end on the arm from the first protruding portion and that projects outward in a radial direction centered on the base portion,

wherein on the base portion side in the circumferential direction in the first protruding portion, a knitting stitch forming edge used when a knitting yarn is pulled in with a hook of a knitting needle is formed,

and

wherein in the second protruding portion, inclined faces inclined toward inner sides in the radial direction are respectively formed on the front end side and on the base portion side on the arm.

#### Brief description of Drawings

Other and further objects, features, and advantages of the invention will be more explicit from the following detailed description taken with reference to the drawings wherein:

FIG. 1 is a side view showing the configuration of the main portions of a movable sinker apparatus 1 of a weft knitting machine according to an embodiment of the invention;

FIG. 2 is a side cross-sectional view of the vicinity of a needle bed gap 2 in a state where sinkers 8 are in forward positions in the weft knitting machine in FIG. 1;

FIG. 3 is a side cross-sectional view of the vicinity of the needle bed gap 2 in a state where the sinkers 8 are in the forward positions in the weft knitting machine in FIG. 1;

FIG. 4 is a side cross-sectional view of the

Furthermore, the protruding portions of the sinkers are positioned closest toward the needle beds opposed thereto, when the protruding portions are on a straight line linking between the centers of swinging displacements of the base portions of the sinkers that are supported in the vicinity of the needle bed gap on the needle beds, and thus it is possible to sandwich the knitting fabric from both sides. When the front and rear needle beds are made symmetric, the straight line becomes horizontal, and thus the forces applied on the knitting fabric when the sinkers are swingingly displaced are directed downward in the vertical direction, so that it is possible to sufficiently pull down the knitting fabric.

Furthermore, in the protruding portion of the front end portion of the sinker, inclined faces inclined toward inner sides in the radial direction of a swinging displacement centered on the base portion are respectively formed on the front end side and on the base end side on the arm, and thus with a swinging displacement, it is possible to easily remove the second protruding portion from a knitting stitch of a sandwiched knitting fabric. In particular, even when a knitting fabric is pulled upward and the tensile force is applied while transferring a stitch, since the inclined faces are formed, it is easy to remove the second protruding portion, and thus it is

possible to prevent a yarn from being broken.

Furthermore, according to the invention, a sinker can be used in a movable sinker apparatus in which its base portion is supported in a swingingly displaceable manner in the vicinity of a needle bed gap on a needle bed of a weft knitting machine and in which its front end portion is moved forward into the needle bed gap and thus a knitting fabric is knitted by an interaction with a knitting needle. The front end portion of the sinker has the shape of an arm that extends to a lower portion of the needle bed gap in a circumferential direction with a substantially constant radius from the base portion. On the arm are formed a first protruding portion that is formed between the base portion and the front end and that projects in the circumferential direction on the front end side, and a second protruding portion that is formed on a portion closer to the front end on the arm from the first protruding portion and that projects outward in a radial direction centered on the base portion. A knitting yarn receiving portion and a knitting stitch forming edge that are provided in the first protruding portion knit a knitting fabric by an interaction with the knitting needle, and thus it is possible to reliably form a knitting stitch. A knitting fabric in a lower portion of the needle bed gap is sandwiched and pulled down by the second protruding

portions of the sinkers provided on the needle beds that are opposed to each other, and thus it is possible to sufficiently pull down the knitting fabric in the lower portion of the needle bed gap.

Furthermore, according to the invention, in the second protruding portion of the front end portion of the sinker, inclined faces inclined toward inner sides in the radial direction of a swinging displacement centered on the base portion are respectively formed on the front end side and on the base end side on the arm, and thus with a swinging displacement, it is possible to easily remove the second protruding portion from a knitting stitch of a sandwiched knitting fabric. In particular, even when a knitting fabric is pulled upward and the tensile force is applied while transferring a stitch, since the inclined faces are formed, it is easy to remove the second protruding portion, and thus it is possible to prevent a yarn from being broken.

## Claims

1. (Currently amended) A movable sinker apparatus of a weft knitting machine having front and rear needle beds opposed to each other with a needle bed gap interposed therebetween, the movable sinker apparatus comprising:

sinkers arranged next to knitting needles,  
a knitting fabric being knitted by an interaction with knitting needles by applying a force of a spring so as to press down front end portions of the sinkers, and base portions of the sinkers being supported in a swingingly displaceable manner on the needle beds in the vicinity of the needle bed gap, and recessed portions for retaining and pressing down a knitting yarn of a previous loop that has been knitted being formed as knitting yarn receiving portions on front end portions of the sinkers moving forward into the needle bed gap,

wherein the front end portion of the sinker has a shape of an arm extending to a lower portion of the needle bed gap in a circumferential direction with a substantially constant radius from the base portion,

wherein on a portion closer to the front ends from a knitting yarn receiving portions on the arm are formed protruding portions that project outward in radial directions of swinging displacements,

when the protruding portions are on a straight line

linking between centers of swinging displacements of the base portions that are supported by the needle beds, the protruding portions of the sinkers are positioned closest toward the needle beds opposed thereto, and inclined faces inclined toward inner sides in the radial direction are respectively formed on the front end side and on the base portion side in the circumferential direction, and

wherein the protruding portions of the sinkers provided on the needle beds that are opposed to each other pull down a knitting fabric in a lower portion of the needle bed gap, sandwiching the fabric therebetween.

2. (Currently amended) A sinker for use in a movable sinker apparatus having a base portion which is supported in a swingingly displaceable manner in a vicinity of a needle bed gap on a needle bed and a front end portion which is moved forward to the needle bed gap to knit a knitting fabric by an interaction with a knitting needle, the sinker comprising:

a front end portion having a shape of an arm extending to a lower portion of the needle bed gap in a circumferential direction with a substantially constant radius from the base portion,

wherein the sinker is shaped into a plate,

wherein on the arm are formed a first protruding

portion that is formed between the base portion and the front end and that projects in a circumferential direction on the front end side, and a second protruding portion that is formed on a portion closer to the front end on the arm from the first protruding portion and that projects outward in a radial direction centered on the base portion,

wherein on the base portion side in the circumferential direction in the first protruding portion, a knitting stitch forming edge used when a knitting yarn is pulled in with a hook of a knitting needle is formed, and

wherein in the second protruding portion, inclined faces inclined toward inner sides in the radial direction are respectively formed on the front end side and on the base portion side on the arm.

3. (Canceled)

4. (Canceled)